

REMARKS

Claims 2-23 are currently pending in this application. By the foregoing amendment, claims 2, 16 and 18 have been amended. Specifically, claims 2, 16, and 18 have been amended to recite that the light beam impacts the conveyor at an angle relative to a perpendicular extending therefrom. These amendments to are supported by originally filed Figures 2, 3, and 5 and by the originally filed specification (pages 8 and 9). New claims 21-23 have been added to this application. Two Terminal Disclaimers are respectfully submitted herewith. No new matter has been added to the application by this Amendment.

SPECIFICATION

The Examiner has required a new title which is indicative of the invention to which the claims are directed. Accordingly, Applicants have changed the title to "system for dimensioning objects using at least one light beam offset relative to a perpendicular from an object supporting surface."

Applicants respectfully request that the Examiner reconsider and approve the new title of this application.

The Examiner also requested that the "continuation data" for this application be updated. The Examiner's attention is respectfully drawn to the Preliminary Amendment filed on July 6, 2001 in which Applicants amended the application to include a new, updated

"Cross-Reference To Related Applications" section. Applicants respectfully request that the Examiner reconsider and withdraw the request that the "continuation data" be updated for this application.

CLAIM REJECTIONS - 35 U.S.C. §103

The Examiner has rejected claims 2-20 under 35 U.S.C. §103(a) as being unpatentable over Kakinoki et al. (U.S. Patent No. 5,004,929) in view of Schmutz (U.S. Patent No. 5,555,090). Applicants respectfully traverse this rejection as applied to the amended claims.

One embodiment of Applicants' invention is directed to a system for dimensioning objects that uses at least one light beam which impacts the conveyor at an angle relative to a perpendicular extending therefrom. The reflections from the light beam striking the conveyor or an object positioned thereon are detected by a detector having a field of view which extends along the perpendicular. Referring to Figure 5, the object 14 height at a given point is measured by triangulation using the offset angle θ . This offset angle θ between the laser beam 21 and the normal camera field of view 42 above the conveyor creates a horizontal offset d between the intercept point 40a where the laser beam normally intercepts the conveyor surface and an image point 40b where the laser beam 21 strikes the object 14 supported thereon. This offset d is detected by the detector's field of view 42.

Thus, when the intercept point 40a and the image point 40b are the same, the detector determines that no object is present. (Specification, page 8, lines 11-23). When a difference exists between intercept point 40a and image point 40b, the dimensioning system uses the data to determine a desired measurement of the object.

To establish a *prima facie* case of obviousness, "the prior art reference (or references when combined) must teach or suggest all the claim limitations" (MPEP § 2142).

Applicants' claims 2, 16, and 18 each recite, *inter alia*, "wherein the light beam, when not obstructed by the object, impacts the conveyor at an angle relative to a perpendicular extending therefrom."

Kakinoki et al. are directed to an optical system for measuring an object. Referring to Figure 4, a light beam L_5 that impacts the conveyor or an object thereon is oriented perpendicular to the conveyor. Thus, the scanning beam L_5 is "directly and vertically incident upon the object 50 from above" (Specification, col. 5, lines 20-21). In complete contradiction with Applicants' invention, Kakinoki et al. rely upon the reflected light beam L_6 to be angularly offset from the light beam that impacts the object or the conveyor in order to measure the object. This small inclination angle between the light beam L_5 (which is perpendicular to the conveyor) and the reflected light L_6 results in the reflected light L_6 being reflected by a combination of mirrors to condense the light using a converging lens

33 onto an optical detector 35 (Specification, col. 5, lines 29-43). Kakinoki et al. fail to disclose, teach or suggest a dimensioning system that uses a light beam that impacts a conveyor at an angle relative to a perpendicular extending from the conveyor.

The deficiencies in the teachings of Kakinoki et al. are not remedied by Schmutz. Schmutz is directed to a system for dimensioning objects. Referring to Figure 2, light is generated by a source 20 which generates an energy beam having a structured pattern (Specification, Col. 2, lines 59-63). As clearly shown in Figure 2, the energy beam is directed perpendicularly toward an object 10 and the object supporting surface. A sensor 80 is used to determine the irradiation caused by the object to determine a dimension of the object. Schmutz completely fails to disclose, teach or suggest a light beam which impacts the conveyor at an angle relative to a perpendicular extending from the conveyor.

Applicants respectfully submit that Kakinoki et al. and Schmutz fail to disclose Applicants' element, recited in each of claims 2, 16 and 18, of "wherein the light beam, when not obstructed by the object, impacts the conveyor at an angle relative to a perpendicular extending therefrom." As described above, both Schmutz and Kakinoki et al. rely on the light beams or energy beams being oriented perpendicular to an object or an object supporting surface. Applicants respectfully submit that the recited combination fails to disclose, teach or suggest each of Applicants' elements. Applicants respectfully submit that

claims 2, 16 and 18 are patentable over the cited references. Additionally, claims 3-15, 17, 19, and 20 depend, directly or indirectly, upon one of claims 2, 16 and 18 and, accordingly, are also patentable over the cited combination for at least the above-stated reason.

Applicants respectfully request that the Examiner reconsider and withdraw the Section 103 rejection of claims 2-20 using Kakinoki et al. in view of Schmutz.

The Examiner has rejected claims 2-20 under 35 U.S.C. §103(a) as being unpatentable over Nordbryhn (U.S. Patent No. 4,996,440) in view of Schmutz.

Applicants' claims 2, 16, and 18 recite, *inter alia*, "wherein the light beam, when not obstructed by the object, impacts the conveyor at an angle relative to a perpendicular extending therefrom."

Nordbryhn is directed to a device for measuring dimensions. Referring to Figure 1, a laser 3 generates a light beam 4 that is reflected off of a small mirror 5. The small mirror 5 reflects the light beam 4 perpendicularly downwardly toward a rotating, angled flat mirror 1. The flat mirror 1 is rotated by a motor 2 which causes the reflected light beam 4 to be horizontally reflected toward an innersurface of a hollow truncated cone mirror 7. When the light beam 4 is reflected off of the innersurface of the cone mirror 7, the light beam is directed toward an object 8 along a perpendicular relative to the object. Back reflections from the object 8 are sent to a light receiver 9 via the hollow truncated cone 7 and the flat

mirror 1. Referring to Figure 5, the light beams extending from another embodiment of a stationary measuring device 22 also impact on the conveyor along a perpendicular extending from the conveyor. Figure 9 illustrates another embodiment formed by an array of light generating elements each projecting a light beam perpendicularly onto a surface. Nordbryhn utterly fails to disclose, teach or suggest the use of a light beam that impacts a conveyor at an angle relative to a perpendicular extending from the conveyor. As discussed above in regard to the first Section 103 rejection, Schmutz also fails to disclose such an element.

Applicants respectfully submit that Nordbryhn and Schmutz fail to disclose Applicants' element, recited in claims 2, 16 and 18, of "the light beam, when not obstructed by the object, impacts the conveyor at an angle relative to a perpendicular extending therefrom". Accordingly, Applicants respectfully submit that claims 2, 16 and 18 are patentable over the cited combination. Additionally, claims 3-15, 17, 19 and 20 depend, directly or indirectly on one of claims 2, 16 and 18 and, accordingly, are also patentable over Nordbryhn and Schmutz for at least the above discussed reason.

Applicants respectfully request that the Examiner reconsider and withdraw the Section 103 rejection of claims 2-20 using Nordbryhn and Schmutz.

DOUBLE PATENTING REJECTION

The Examiner has rejected claims 2-20 under the judicially created non-statutory

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double patenting doctrine based on U.S. Patents 5,661,561 and 6,177,999. In response, Applicants submit two Terminal Disclaimers that are attached hereto. Applicants respectfully request that the Examiner reconsider and withdraw the double patenting rejection from this application.

INFORMATION DISCLOSURE STATEMENT

The Examiner stated that the Information Disclosure Statement received by the Office on July 12, 2001 failed to comply with 37 C.F.R. §1.98(a)(2) which requires a legible copy of each U.S. and foreign patent cited in an Information Disclosure Statement. The Examiner further stated that while the Information Disclosure Statement received on July 12, 2001 has been placed in Applicants' file, the references therein have not been considered.

Applicants respectfully draw the Examiner's attention to 37 C.F.R. §1.98(d)(1) which states that a copy of any materials identified in an Information Disclosure Statement need not be provided if those materials were cited in an earlier application that is properly identified in the Information Disclosure Statement and that is relied on for an earlier effective filing date under 35 U.S.C. §120. The Supplemental Information Disclosure Statement received by the Office on July 12, 2001 specifically stated that the references cited therein were previously submitted in a prior U.S. patent application from which this application claimed priority pursuant to 35 U.S. §120. That Supplemental Information

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Disclosure Statement also referenced 37 C.F.R. §1.98(d) and pointed out that copies of the references did not need to be provided.

Applicants respectfully submit that the Information Disclosure Statement received by the Office on July 12, 2001 was proper and therefore consideration of the references cited therein is required. For the Examiner's convenience, an additional copy of the PTO-1449 Form that was properly submitted with the Information Disclosure Statement of July 12, 2001 is enclosed herewith. Applicants respectfully request the Examiner consider the cited references which were properly cited to the Office on July 6, 2001 (prior to the receipt of a first office action), initial the appropriate box indicating such consideration, and return a copy of the initialed PTO-1449 Form in the next responsive action.

NEW CLAIMS

New claims 21-23 have been added to this application. Claim 21 recites, *inter alia*, "at least one light source positioned above the conveyor and adapted to transmit a light beam that when not obstructed by the object, impacts the conveyor at an angle relative to a perpendicular extending therefrom." Accordingly, claim 21 is patentable over the outstanding rejections. New claim 22 and 23 depend, directly or indirectly, on claim 21 and, accordingly, are also patentable over the outstanding rejections.

If the Examiner believes that any additional formal matters need to be addressed to

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place this application in condition for allowance, the Examiner is respectfully requested to contact the undersigned, by telephone, at the Examiner's convenience.

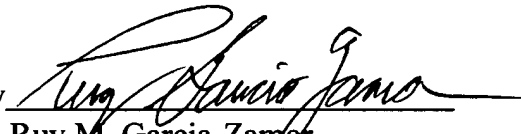
CONCLUSION

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 2-23, is in condition for allowance and a notice to that effect is respectfully solicited.

Respectfully submitted,

Wurz et al.

By



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